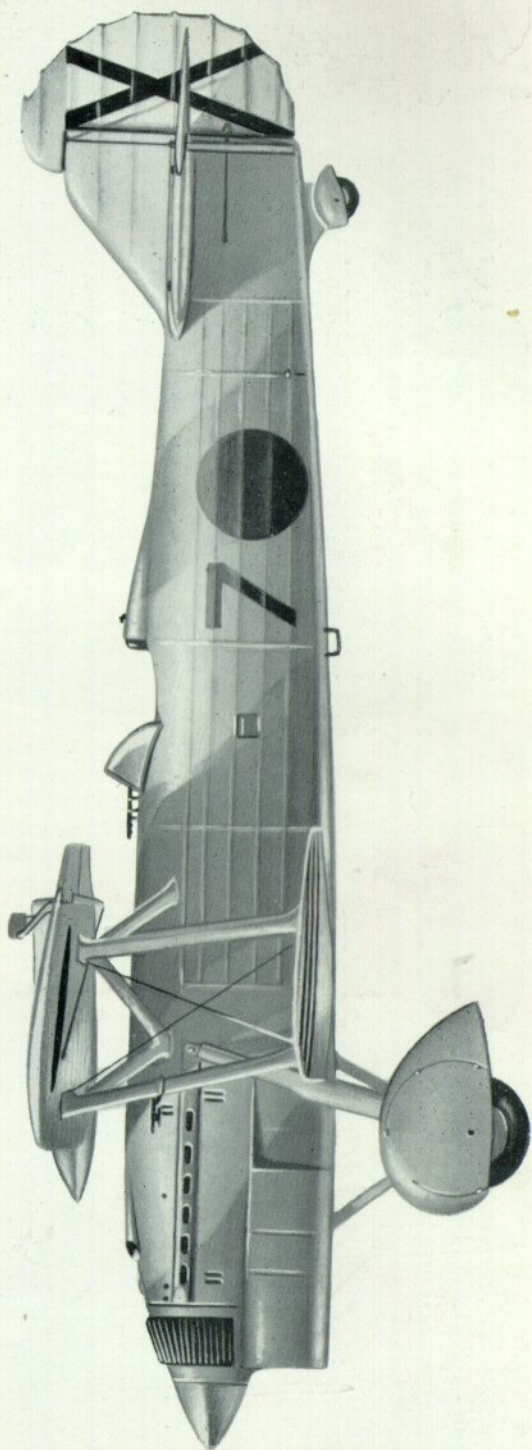


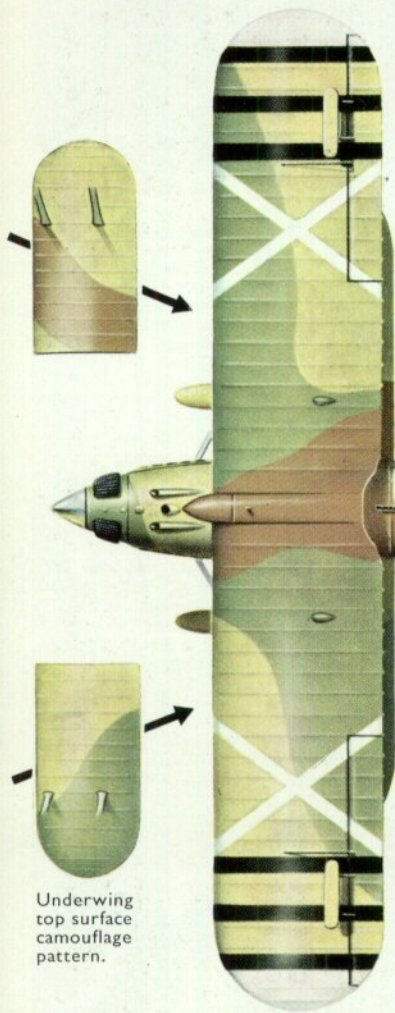
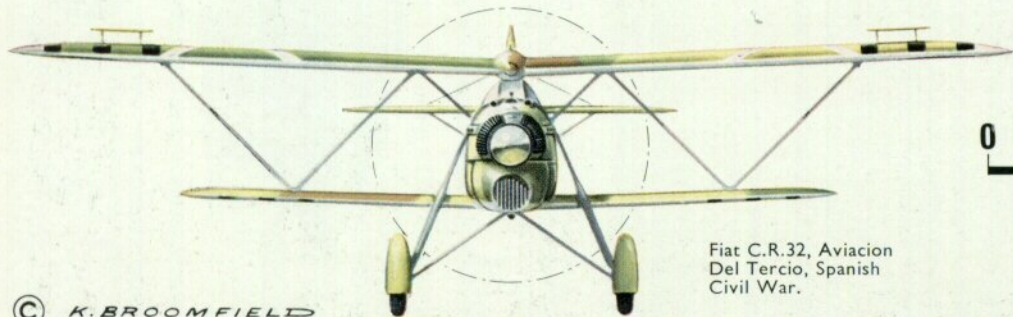
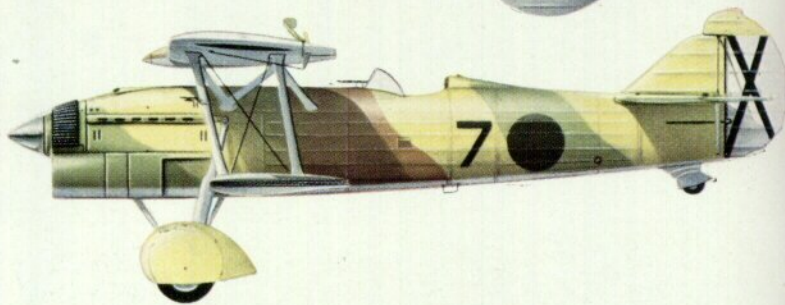
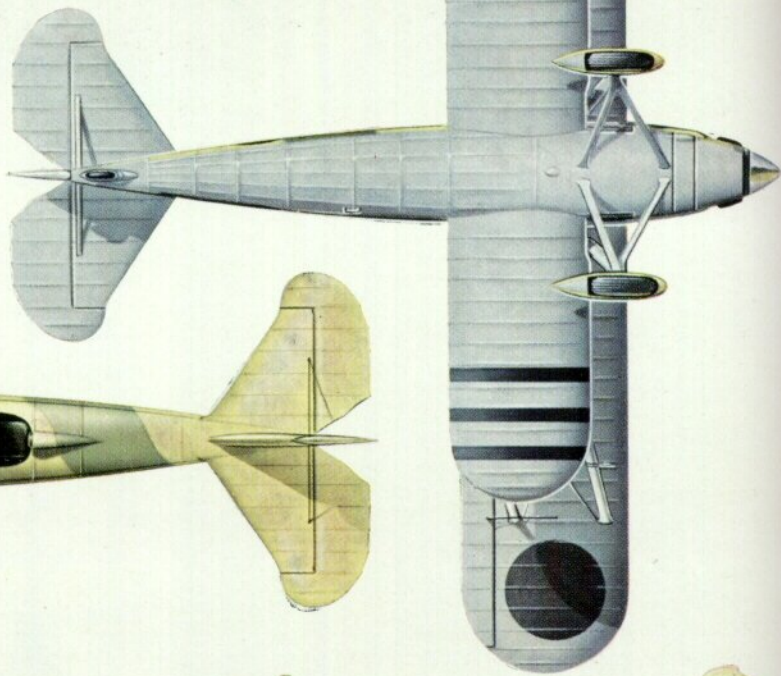
PROFILE PUBLICATIONS

The Fiat CR. 32

NUMBER

22





Underwing
top surface
camouflage
pattern.



Fiat C.R.32, Aviacion
Del Tercio, Spanish
Civil War.



The Fiat C.R. 32

by Gianni Cattaneo

Fiat C.R.32s of the XVI^o Gruppo "Cucaracha" (Cockroach Group) over Spain. Note two different styles of command pennants on nearest and farthest aircraft. (Photo: via R. Ward)

Characterised by superlative manoeuvrability, the Fiat C.R.32 came to be regarded, during the five years preceding the Second World War, simply as the "Italian Fighter". This small aeroplane, designed by Ing. Rosatelli, represented the climax of a ten-year development of a formula deep-rooted in illustrious forebears.

The peculiar array of wing struts, arranged in the form of a Warren truss, appeared for the first time in the well-known S.V.A. scout of 1917 vintage—one of the best aircraft designed by the First World War Italian team which included the young Rosatelli.

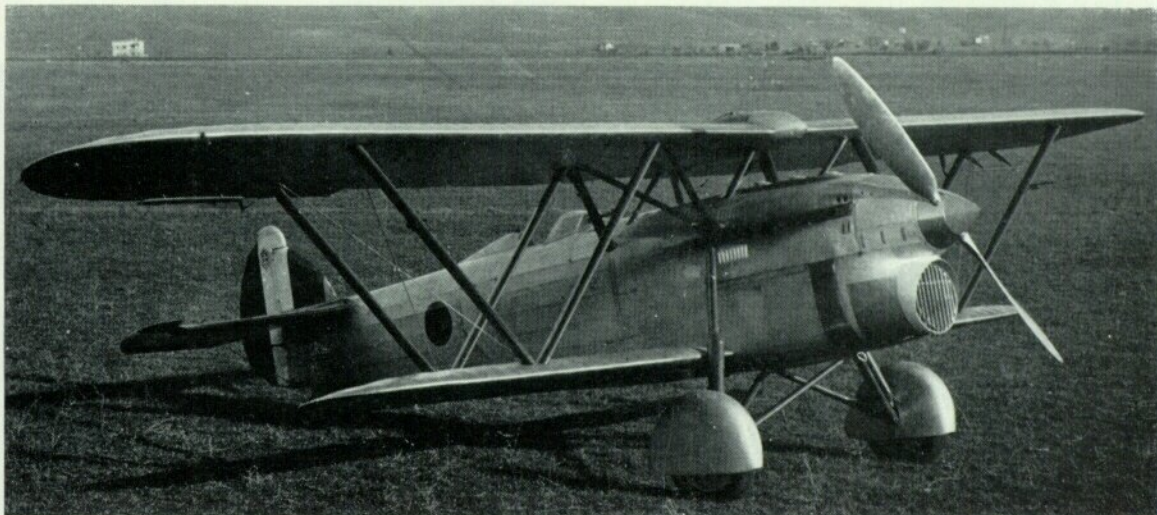
The birth of the new family of fighter aircraft can be dated in about 1923, when the prototype Fiat C.R. with 300-h.p. Hispano-Suiza 42 engine first flew. With few changes the new biplane was produced in quantity as the C.R.1 and was forthwith adopted by the first aerobatic teams of the Italian

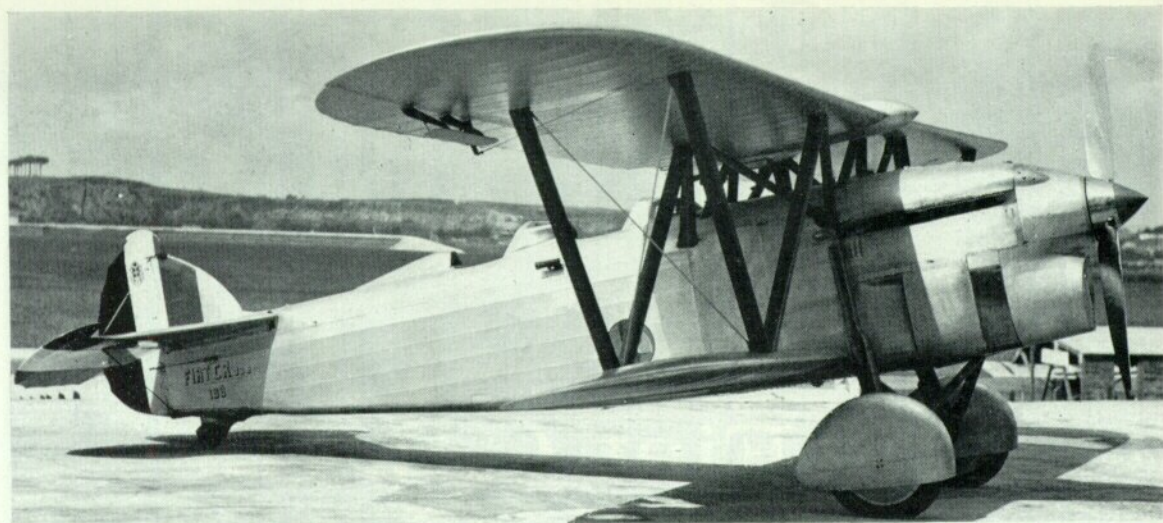
Air Force, and was further destined to achieve great popularity both in Italy and abroad.

From the fundamental C.R.10 prototype, identified by the installation of the 400-h.p. Fiat A.20 engine, were derived the more refined C.R.20 and C.R.20 Asso, (the latter with 450-h.p. Issotta Fraschini "Asso" engine) and eventually, in 1932, the C.R.30 with 600-h.p. Fiat A.30. In the C.R.30 were apparent all the aerodynamic and structural characteristics that were to re-appear one year later in the C.R.32.

The Fiat C.R.30, manoeuvrable and fast for its day, achieved immediate success in July 1932 by winning the important "Dal Molin Cup" for fighter aircraft at the respectable average speed of 215 m.p.h. The C.R.30 was accepted in limited quantity by the *Regia Aeronautica*, but was superseded only one year later by the C.R.32. Exceptional qualities were nevertheless demonstrated by the C.R.30 and, in July 1934, a

The Fiat C.R.30, predecessor of the C.R.32, served with the Regia Aeronautica in limited numbers. (Photo: via Col. Cesar Milani)





A two-seat trainer conversion of the C.R.30; note the tri-coloured elevators.

(Photo: via Col. Cesar Milani)

squadron of twelve aircraft performed the first European tour by a fighter unit in formation. On the Bruxelles-to-Paris leg the speed of the formation was a remarkable 230 miles per hour. The C.R.30 was also exported in small numbers to Austria, China and Paraguay.

Notwithstanding the direct similarity to its precursor, the C.R.32 was small and more compact, its fine handling qualities even further enhanced; it was destined not only to gain international renown but to fight a bitter, bloody, war in Spanish skies. The small fighter began to arrive in first line units late in 1933, first with the *1st Stormo* based at Campoformido, then with the *2nd Stormo* (Turin), the *4th Stormo* (Gorizia), the *3rd Stormo* (Milan), and subsequently with practically every fighter unit in the I.A.F.

THE C.R.32 DESCRIBED

It was a biplane of sesquiplane configuration with considerably greater span in the upper wing. The wing structure consisted of two aluminium alloy

tubular spars with ribs of aluminium square tube. Only the top wing carried ailerons, balanced by outriggered "bench-type" tabs supported by steel struts. The covering was fabric and the two wings were rigged with a stagger of $9^{\circ} 30'$ by a system of steel primary struts and two secondary N-struts between the top wing and the fuselage. The main fuselage structure was an aluminium and steel tubular frame faired externally by a superstructure of U-section longerons and aluminium sheet formers. The covering was of metal panelling from the nose to the cockpit, on the aft decking and in the area around the tailwheel; the remainder was fabric-covered. The cockpit was equipped with an in-flight adjustable seat with parachute incorporated in the squab.

The empennage structure was of aluminium tube, with variable incidence tailplane, and statically- and dynamically-balanced elevator.

The fixed undercarriage was of the split-axle and independent wheel type, and incorporated two main legs with wheel fairings, hydraulic shock absorbers and pneumatic wheel brakes.

The Fiat C.R.32bis mounted two additional 7.7 mm. guns in the lower wings and was powered by an improved version of the Fiat A-30RA engine. (Photo: G. Cattaneo)



The military equipment included a fire extinguisher, a gun camera, an optional survey camera, the pilot's oxygen system and an optical tubular gunsight.

Power was provided by a Fiat A30 R.A.-geared and liquid-cooled 12-cylinder upright-V in-line engine, developing 600 b.h.p. at 10,000 feet and at 2,750 r.p.m. The metal two-blade propeller incorporated ground-adjustable pitch setting.

Two fixed synchronised Vickers or Breda machine guns (0.303-in. or 0.5-in. calibre respectively) constituted the armament, located on the nose decking and firing through the propeller. Later variants mounted two attachment points under the fuselage for twelve light bombs each of 5 lb., one 200-lb or two 100-lb. bombs.

The main fuel tank, situated in the fuselage about the centre of gravity, was of 75 Imp.gal. capacity and an auxiliary 6-gal. tank was mounted in a streamlined fairing in the top wing on the aircraft centreline.

Exceptionally robust, the C.R.32 weighed 4,225 lb. fully loaded with 1,160 lb. of disposable load—including the reconnaissance camera and 350 rounds of ammunition for each gun. At this all-up weight the take-off run was 880 feet and the climb to 10,000 feet occupied 5 minutes 25 seconds; at this height the maximum speed was 237 m.p.h. Still air range was 485 statute miles at 15,800 feet at an airspeed of 200 m.p.h.

The fighter's outstanding quality was its manoeuvrability: the Fiat C.R.32 was undoubtedly one of the most manoeuvrable fighters ever built. Highly praised by its pilots and by them long remembered with affection, the C.R.32 was responsible for the persistence of the biplane formula in I.A.F. design concept—even after the adoption of the monoplane fighter—



This C.R.32ter displays a three-shade segment camouflage scheme. Approximately one hundred examples of this version were built.
(Photo: G. Apostolo)



The final production variant in the series was the C.R.32quater, which remained in production until the autumn of 1939.
(Photo: G. Apostolo)

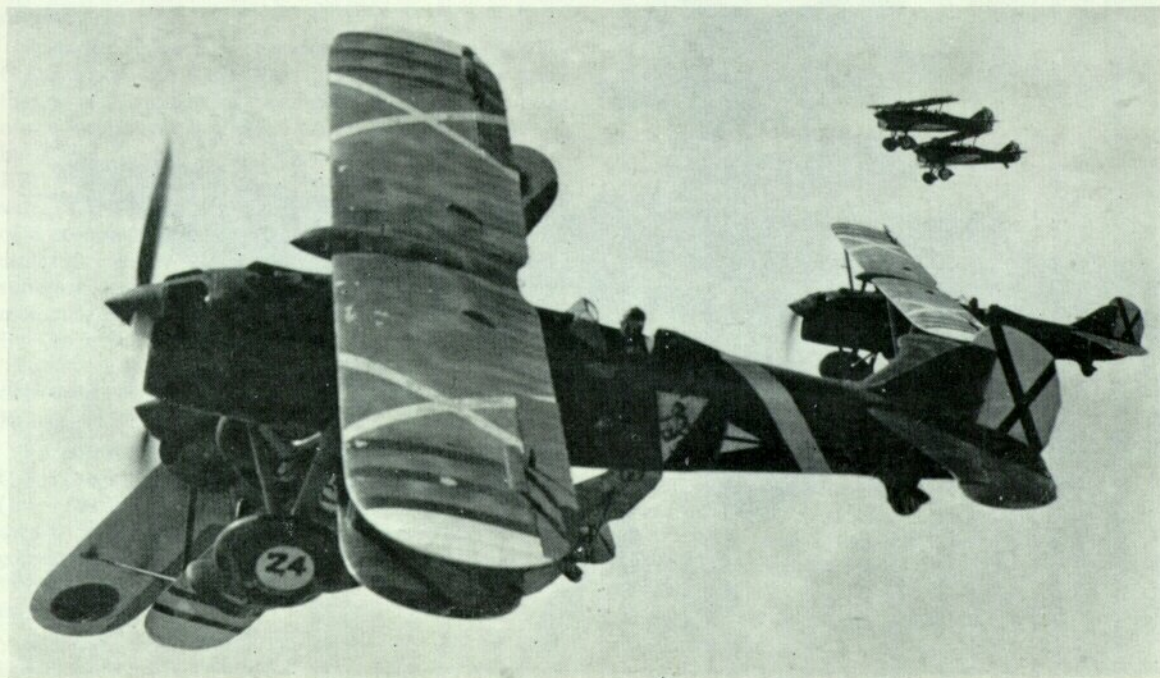
and created the premises for a dangerous overconfidence in an already obsolete design philosophy.

FIATS OVER SPAIN

It is not intended here to recall the political events that led to the outbreak of the Spanish Civil War, nor the causes, already provoking argument between historians, that brought about Italian and German intervention alongside the Nationalist forces against the Republicans, soon to be assisted by massive Russian aid.

C.R.32s of the XVI° Gruppo "Cucaracha" served with distinction with the Italian air component in the Spanish Civil War.

(Photo: G. Cattaneo)

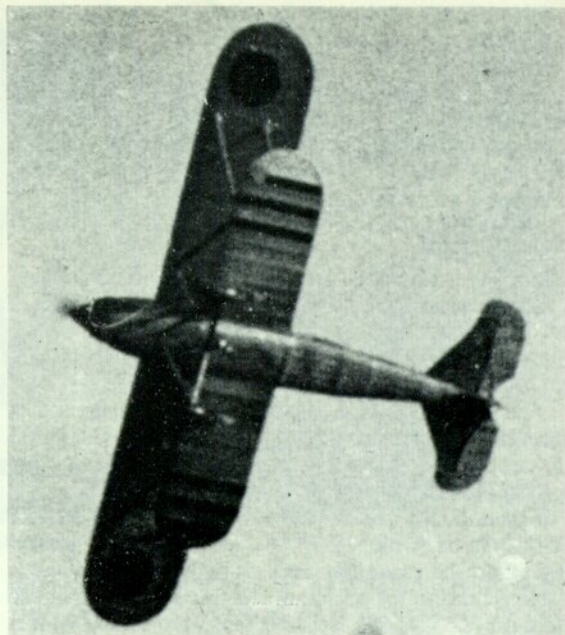


When the Nationalist forces began their insurrection in the summer of 1936, they lacked even an embryonic air force; and the 214 aircraft left in the Republican sectors were also obsolete. Between 1936 and 1939 the Nationalists received 730 aircraft from Italy as the equipment of the "Aviacion del Tercio"; this total was made up of Fiat C.R.32s, S.M.81s, S.M.79s, B.R.20s, Ro.37s, Ba.65s and late in the Civil War, a squadron of G.50s. Germany supplied some 400 aircraft (He 51s, Bf 109s, Ju 87s Do 17s and He 111s) with the "Condor Legion".

The Republicans received a total of 1,947 aircraft from various foreign powers during the war, in addition to the 214 elderly machines with which they began hostilities, the 40 civil types operated by the Government and 55 aircraft built in the Red Zone during 1937-8. Of this force, 400 were destroyed during training and in accidents and no less than 1,520 machines fell in combat with Nationalist pilots. To the Italian and mercenary aviators of the "Tercio" 943 victories were credited, about 60 per cent of these being achieved by the fighter units which were almost exclusively equipped with Fiat C.R.32 variants.

The activities of the Italian air component in Spain between August 1936 and March 1939 may be summarised by the following figures:

Aircraft sent to Spain	730
Engines sent to Spain	700
Sorties flown	86,420
Bombing sorties flown	5,318
Hours flown on operations	138,265
Aerial engagements	266
Enemy a/c destroyed in air	903



Note the underwing markings displayed by this *Aviacion del Tercio* Fiat C.R.32.

Enemy a/c destroyed on ground	40
Total aircraft lost	186
Aircraft lost on operations	86
Flying personnel lost	175

Of the 1,947 aircraft received by the Republicans, 1,409 were sent from Russia (including 550 I-15 "Chato" fighters and 475 I-16 "Rata" fighters), 260

*C.R.32s of the XVI^o Gruppo escort an *Aviacion del Tercio* S.M.81 on a bombing mission over Government lines in Spain.*

(Photo: G. Apostolo)



from France (including 70 Dewoitine D.371, D.500 and D.510 fighters; 20 Loire Nieuport 46 and 15 Bleriot-Spad S.510 fighters), 72 from the United States (no fighters), 72 from the Netherlands (including 26 Fokker D.XXI fighters), 57 from England (no fighters) and 47 from Czechoslovakia (no fighters).

The first Fiat C.R.32 fighters arrived by sea at Melilla in August 1936 and gained their first air victory over Cordoba one week later. This first contingent of 12 aircraft was soon reinforced and before many weeks the four famous fighter units of the "Aviacion del Tercio" appeared in Spanish skies; the VI° Gruppo "Gamba di Ferro" (Iron Leg); the XVI° Gruppo "Cucaracha" (Cockroach); the X° Gruppo "Baleari"; and the XXIII° Gruppo "Asso di Bastoni" (Ace of Clubs). All these units were equipped with the Fiat C.R.32, of which 380 examples were received by Italian and Spanish units during the Civil War.

The C.R.32 soon established its superiority over the mixed equipment of the Republican Air Force; and Rosatelli's nimble fighter continued to acquit itself well in the late autumn of 1936 when more modern types began to appear with Red units. Successes were achieved not only against biplanes of comparable performance such as the I-15 but also against faster monoplanes such as the "Rata" and the pride of the Russian bomber units, the SB-2 "Katiuska". These latter aircraft were at first erroneously identified as American Martin bombers; although faster than the Fiat, their speed was neutralised when patrolling C.R.32s were able to take advantage of height to making diving interceptions.

The appearance of the first I-15s over Madrid took the Italian aviators by surprise and two C.R.32s were lost in the initial encounter; the following day, however, they destroyed seven "Chatos" over the capital.

A more formidable opponent of the "Tercio's" C.R.32s was the I-16 "Rata", the most widely used fighter in Government units after the reorganisation of the Republican forces in March 1937. Usually flown by Soviet aircrew on six-month tours of duty, the I-16, with its retractable undercarriage and cantilever wing, represented an advance in design philosophy of a complete generation over the C.R.32. However, although slower than the "Rata" the Fiat was a superior gun platform and enjoyed advantages in manoeuvrability, diving speed and turning radius. By the end of hostilities in Spain 496 of the 550 "Ratas" supplied to the Government forces had been destroyed; of the 475 I-15s and 210 SB-2s sent from Russia, 415 and 178 respectively had also been lost.

Foremost among the Spanish pilots who flew the C.R.32 was the leader of the famous "Patrulla Azul" (Blue Patrol), Garcia Morato. This legendary pilot died in a flying accident after the Civil War, having gained many of his 35 air victories while flying the "Chirri", as the Spaniards affectionately christened the C.R.32.

Between 1938 and 1942 the C.R.32 *quater* was licence-built as the HA-132-L by the Hispano Aviacion



Aviacion del Tercio C.R.32 in segment camouflage scheme.
(Photo: G. Cattaneo)



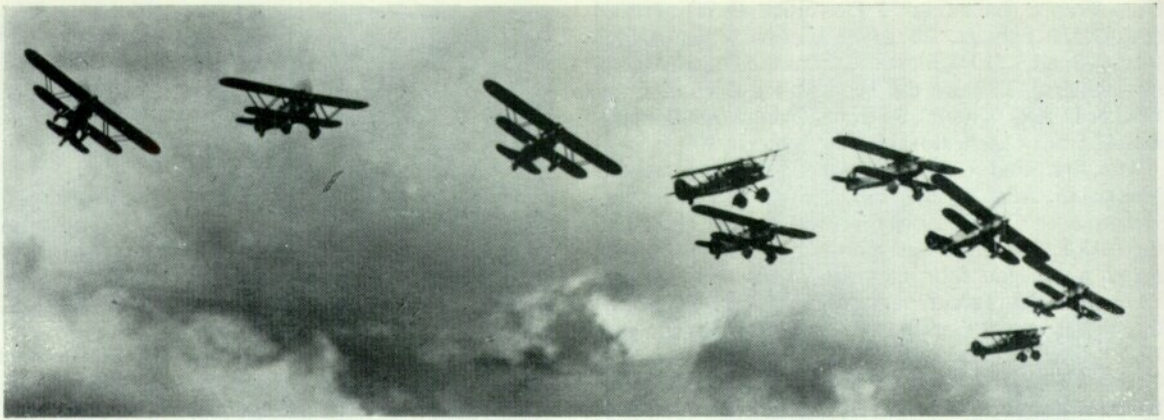
The 163 Squadriglia of the Regia Aeronautica operated C.R.32s from the Aegean island of Rhodes in 1940. (Photo: G. Cattaneo)



Formation of "Cockroach Group" C.R.32s.
(Photo: G. Apostolo)

company. Small numbers were used as aerobatic trainers as late as 1953, with the official designation C.1.

The practical combat experience gained by C.R.32 pilots over Spain confirmed the high opinion of the aircraft already earned in many countries in the more peaceful context of demonstration flying by aerobatic teams of the Italian Air Force. The perfect co-ordination of the controls, small turning circle and excellent general handling qualities made the C.R.32 the ideal aircraft for such displays, the pilots involved attaining a highly sophisticated level of flying skill at the same time as providing an impressive spectacle. A team consisting of five pilots from the I Stormo and



Emulating the angles of their Warren truss interplane struts; this zig-zag formation was a familiar sight at pre-war international air meetings. (Photo: G. Apostolo)

five from the II Stormo gained particular renown during a Latin American tour in 1938, performing in Peru, Argentina and Brazil. The C.R.32 also appeared with considerable success at various international military aviation meetings in Europe, including appearances at Zurich and Budapest.

Four principal versions of the C.R.32 appeared between 1933 and 1938. The standard C.R.32 of which some 350 were built, was powered by the Fiat A-30RA engine and mounted two 12.7 mm. machine guns. The C.R.32*bis* had an improved powerplant, the Fiat A-30RA*bis* and carried two additional 7.7 mm. guns in the lower wing at the junction of the outboard interplane struts. The *bis* saw some service in Spain; but the increased weight (4,350 lb.) had an adverse effect on its performance. The C.R.32-*ter* and -*quater* reverted to the original armament, but with improved sights and instrumentation; radio installations were fitted to some C.R.32*quater* machines.

EXPORT SALES

Small numbers of the C.R.32*bis*, -*ter* and -*quater* variants were exported to Venezuela and Paraguay, the latter country employing them during the final stages of the brief but violent "Gran Chaco" war between Paraguay and Bolivia. A further batch were purchased by China and participated in combat over Shanghai with Japanese intruders. One dozen C.R.30 and C.R.32 fighters were acquired by Austria, and following the *Anschluss* of 1938 they were taken over by the Luftwaffe, marked with standard black crosses and swastikas and employed as training machines.

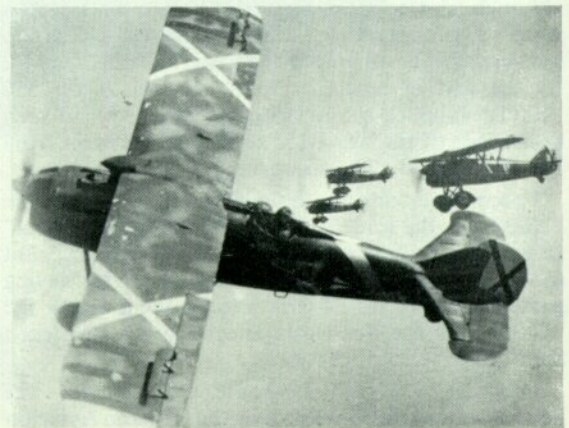
The other main foreign operator of the Fiat C.R.32 was Hungary. Several aircraft were purchased during the expansion of the Hungarian Air Force in preparation for possible conflict with states of the "Little Entente". After the re-annexation of Carpatho-Ruthenia in 1939 a squadron of Hungarian C.R.32s destroyed without loss nine intruding Avia and Letov aircraft of the Slovak Air Force. With the arrival of the more modern C.R.42 and Reggiane Re.2000 on Hungarian squadrons, the C.R.32 was relegated to the training rôle.

THE C.R.32 IN W. W. II

Early in November 1939 the Fiat C.R.32 was still numerically the most important fighter equipping the Italian Air Force, a total of 292 aircraft being on the strength of first line squadrons as compared to 143 C.R.42s, 19 G.50s, 29 Macchi-Castoldi M.C.200s and 31 Ro.44s. Four complete *Stormi*, an autonomous *Gruppo* and an autonomous *Squadriglia* were equipped exclusively with the type, and another *Stormo* operated a mixed strength of C.R.32s and C.R.42s. Nevertheless, the little Spanish veteran was undeniably obsolete and during the period of Italian non-belligerence (November 1939 to June 1940) a programme of progressive replacement of the C.R.32 in squadron service was carried out.

When Italy entered the Second World War in the second week of June 1940, the C.R.32 was in first line service with the following units: *22nd Gruppo* of the *52nd Stormo*, based at Pontedera; *2nd Gruppo*, based at Grottaglie; *1st Stormo* based at Palermo (some C.R.42s also on strength); *3rd Gruppo*, based at Monserrato. In Libya were based the *13th Gruppo* at Castelbenito and the *8th Gruppo* at Benina. The *160th Gruppo* was based at Tirana in Albania, the *136th Squadriglia* in the Aegean and the *410th* and *411th Squadriglie* in Italian East Africa.

"Cockroach Group" squadron commander's C.R.32 over Spain.





This C.R.32, photographed in the grounds of an Italian museum, is finished in a Spanish camouflage pattern. (Photo: G. Cattaneo)

Some use of the C.R.32 was made in North Africa during the first offensive in the summer of 1940, which led to the conquest of Sidi Barrani. The Fiat was mostly active in the ground-strafting and light attack rôle, supplementing the Ba.65s of the *50th Stormo Assalto*, of limited usefulness in the desert war. It also saw some action in the opening stages of the campaigns in Greece and the Aegean; and because local conditions made its replacement by the C.R.42 a difficult operation in the case of the units in Italian East Africa, the C.R.32 bore the brunt of the operations of the *410th* and *411th Squadriglie*. Notwithstanding their marked inferiority to the enemy's equipment, C.R.32s had the fortune on two occasions

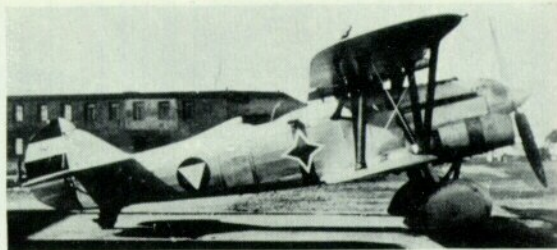
to shoot down aircraft of such superior performance as the Hawker Hurricane. Some success was obtained in the early fighting in Somaliland, but conditions worsened and soon only miracles of ingenuity and improvisation sufficed to keep the weary C.R.32s operational, lacking fuel, ammunition and spares and opposed by machines of the calibre of the Gloster Gladiator and Hawker Hurricane.

The first line service of the C.R.32 was over, and the remaining machines were relegated to the training schools where they gave reliable and popular service until the end of the Second World War. For a short time some trials were carried out concerning the Fiat's possible use as a night fighter, involving the installa-

C.R.32 fighter trainer of the Hungarian Air Force in late-scheme markings.

(Photo: G. Cattaneo)





The Austrian Air Force operated C.R.30s (left) and C.R.32s (right) until the Anschluss of 1938; subsequently they were used by the Luftwaffe as trainers. (Photo: G. Cattaneo)

tion of a long exhaust pipe with flame damping fittings; but little success was achieved and the project was dropped.

The story of the C.R.32 would not be complete without reference to the four prototypes which linked the aircraft with its successor, the Fiat C.R.42 (*Profile No. 16*). The prototype C.R.40 first flew in 1934, powered by a Bristol Mercury IV radial engine of 550 h.p.; the upper wing was connected directly with the fuselage in a gull-wing configuration, giving better pilot visibility. The same year saw the appearance of the C.R.40*bis*, in which the British powerplant was replaced by a 700 h.p. Fiat A-59R. The C.R.41 was powered by a Gnome-Rhone K-14 engine of 900 h.p., and tested two armament systems, the first involving two 20 mm. Oerlikon cannon and the second comprising four 12.7 mm. machine guns. Maximum speed was 265 m.p.h. The C.R.33 reverted to the wing arrangement of the C.R.32 and was powered by a 700 h.p. Fiat A-33 engine, driving a three-bladed airscrew. This last prototype, which mounted four guns, flew in 1937.

The C.R.32 was for five years the mainstay of *Regia Aeronautica* fighter units, and with its excellent

service record in Spain to support the affection held for it by all who flew it the agile and aggressive fighter represented the zenith of conventional biplane design. It is interesting to note that both the C.R.32 and its British contemporary, the Gloster Gauntlet (*Profile No. 10*) were eventually replaced in service by fighters of biplane configuration which nevertheless

FIAT C.R.32ter—SPECIFICATION

(Data from Technical Manual C.A. 351 of "Ministero dell'Aeronautica").

Powerplant: One FIAT A.30 R.A. bis in line, liquid cooled, 600 h.p. rated at 2,750 r.p.m. FIAT two bladed propeller, with adjustable pitch, diameter 9.242 feet.

Dimensions: Wing span (upper) 31.168 ft.; Wing span (lower) 20.160 ft.; Length 24.294 ft.; Height 8.634 ft.; Wing area 237.880 sq. ft.

Weight (lb.): Empty 3,205; Useful load 1,015 of which—Pilot 176; Rounds 129 (350 each gun); Various 48; Fuel 573; Oil 53; Camera 36. Total loaded 4,220.

Performance: (at 600 h.p. and 2,750 r.p.m.); Maximum speed: sea level 206 m.p.h.; 10,000 ft. 220 m.p.h.; 20,000 ft. 208 m.p.h.; Landing speed: 65 m.p.h.; Climb to: 3,000 ft. 1 min. 35 sec.; 10,000 ft. 5 min. 25 sec.; 20,000 ft. 14 min. 25 sec.; Combat ceiling 25,250 ft.; Take off run 890 ft.; Landing run 755 ft.; Range (15,800 ft. and 196 m.p.h.) 485 miles.

Armament: Two 12.7 mm. calibre SAFAT machine guns. Provision for under-fuselage rack for light bombs.

Only known photograph of a Fiat C.R.32 of the Chinese Air Force. These aircraft fought in the defence of Shanghai against Japanese bomber attacks. (Photo: G. Apostolo)



Fiat C.R.32, 74° Sq., XXIII° Gruppo,
3° Stormo in pre-1938 all-silver finish.



74° Squadriglia.



Coat of Arms
of the House
of Savoia,
rudder marking.

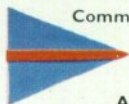
Fiat C.R.32, XVI° 'Cucuracha' Gruppo,
Spanish Civil War.



Fiat C.R.32, 410° Sq., Diredaua and
Addis Ababa, Abyssinia, 1940-1.



Command Pennant.



Fiat C.R.32bis,
Austrian Air Force, No. 147.



XVI Gruppo,
'Cucuracha' (Beetle).



Fuselage fasces marking.



410° Squadriglia.



Fiat C.R.32, Luftwaffe fighter-trainer,
ex-Austrian Air Force.



Fiat C.R.32, Hungarian
Air Force in pre-autumn
1942 markings.
Fighter-trainer.

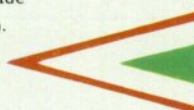
152° Gruppo,
'Asso di Bastoni'
(Ace of Clubs).



153° Gruppo,
'Asso di Spade'
(Sabre Ace).



Hungarian A.F.
wing marking.



6° Stormo,
(Red Devil),
'Diavolo Rosso'



Fiat C.R.32, Hungarian Air Force
in post-autumn 1942 markings.
Fighter-trainer.



X° Gruppo
'Baleari'
Aviazione del Tercia



Chinese A.F.
wing marking.



Fiat C.R.32, Chinese Air Force.

Note: All unit markings are Regia Aeronautica.



A Hungarian Air Force C.R.32 displaying pre-autumn 1942 tail flash and post-autumn 1942 fuselage marking. (Photo: G. Cattaneo)

displayed many features characteristic of the generation of monoplanes which was to follow—the Fiat C.R.42 and the Gloster Gladiator. The C.R.32 may

thus be said to have been in the forefront of the last of the world's true biplane fighters.

© Gianni Cattaneo, 1965.

REPRESENTATIVE UNITS OF THE ITALIAN AIR FORCE EQUIPPED WITH THE FIAT C.R.32

Units		Sq.	Based at	Date
1° Stormo	6° Gruppo	Sq. 79–81–88	Campoformido (Italy)	1936
4° Stormo	9° Gruppo	Sq. 73–96–97	Gorizia (Italy)	1936
	10° Gruppo	Sq. 84–90–91	Gorizia (Italy)	1936
3° Stormo	18° Gruppo	Sq. 83–85–95	Milan (Italy)	1937
	23° Gruppo	Sq. 74	Milan (Italy)	1937
6° Stormo	2° Gruppo	Sq. 150–151–152	Campoformido (Italy)	1936
	3° Gruppo	Sq. 153–154–155	Campoformido (Italy)	1936
52° Stormo	22° Gruppo	Sq. 359–362–369	Pontedera (Italy)	1939
	24° Gruppo	Sq. 354–355		1939
51° Stormo	20° Gruppo	Sq. 351–352–353	Ciampino (Italy)	1938
	160° Gruppo		Tirana (Albania)	1940
		Sq. 163	Rhodes (Aegean)	1940
		Sq. 410 (ex 150)	Dire-Dana (Italian East Africa)	1940
		Sq. 411	Addis Ababa (Italian East Africa)	1940
	13° Gruppo	Sq. 167	Castelbenito (Libya)	1940
	8° Gruppo		Tobruk (Libya)	1940

Note: The location indicated is related to a specific date, since in the pre-war period the units were often moved to different bases. The fighter Stormo was made up of two Gruppi; each Gruppo comprised three Squadriglie of 12 a/c (officially) each.

Tab and bracing detail is visible in this photograph of a Hungarian C.R.32 quarter trainer in early-style markings. (Photo: via R. Ward)

